

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 39

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte HIROYUKI MANO, KIYOKAZU NISHIOKA,  
TOSHIO FUTAMI, and KIYOSHIGE KINUGAWA

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Appeal No. 1998-1319  
Application No. 08/466,188

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HEARD: May 15, 2000

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Before FLEMING, GROSS, and LEVY, Administrative Patent Judges.  
GROSS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 9, 10, 15, and 18 through 44, which are all of the claims pending in this application.

Appellants' invention relates to a method of displaying a multi-tone image in response to an analog image signal and a matrix display device which displays the multi-tone image.

The method involves producing multi-tone voltage selecting data based on analog image data and outputting a multi-tone voltage having a constant voltage level during each horizontal scanning period. Claims 18 and 34 are illustrative of the claimed invention, and they read as follows:

18. An information processing system comprising:

an information device for outputting an analog display data; and

an image display device, said image display device including:

a matrix display panel having plural X direction signal lines and plural Y direction signal lines, said plural X direction signal lines and said plural Y direction signal lines intersecting at intersecting points, the intersecting points of said matrix being pixels of a display image,

an A-D converter circuit for receiving said analog display data and converting said analog display data into digital display data,

a Y direction driving circuit for driving said plural Y direction signal lines by sequentially providing a select signal to said plural Y direction signal lines,

a voltage generator for simultaneously generating a plurality of discrete output signals at respectively different voltage levels, each of said voltage levels being a constant voltage level, and

an X direction driving circuit for receiving digital display data and for providing image signals to said plural X direction signal lines, wherein

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said X direction driving circuit includes a selector circuit for selecting one of said discrete output signals from said voltage generator as one of said image signals in accordance with said digital display data and providing one image signal formed by said one discrete output signal to said plural X direction signal lines.

34. A method of displaying a multi-tone image, comprising the steps of:

producing multi-tone voltage selecting data based on analog image data including multi-tone image data; and

outputting a multi-tone voltage having a constant voltage level during one horizontal scanning period in accordance with said multi-tone voltage selecting data.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Suzuki	4,571,584	Feb. 18,
1986		
Arai	4,748,444	May
31, 1988		
Aoki et al. (Aoki)	4,775,891	Oct. 04,
1988		
Mano et al. (Mano)	5,298,912	Mar. 29,
1994		

Appellants' admitted prior art as shown in prior art Figures 1 and 2 (APA)

Claims 9, 10, 15, and 18 through 44 stand rejected under 35 U.S.C. § 103 as being unpatentable over Aoki.

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Claims 9, 10, 15, and 18 through 44 stand rejected under 35 U.S.C. § 103 as being unpatentable over APA in view of Arai and Suzuki.

Claims 9, 10, 15, and 18 through 44 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the prior invention as set forth in claims 1 through 20 of Mano.<sup>1</sup>

Reference is made to the Examiner's Answer (Paper No. 31, mailed April 8, 1997), the First Supplemental Examiner's Answer (Paper No. 34, mailed September 22, 1997) and the Second Supplemental Examiner's Answer (Paper No. 36, mailed December 8, 1997) for the examiner's complete reasoning in support of the rejections, and to appellants' Brief (Paper No. 30, filed December 23, 1996), Reply Brief (Paper No. 32, filed June 9, 1997), and Supplemental Reply Brief (Paper No. 35, filed November 24, 1997) for appellants' arguments thereagainst.

#### OPINION

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<sup>1</sup> Since the rejection of claims 18 through 27 under 35 U.S.C. § 101 was not repeated in the Answer, but claims 18 through 27 were included in the obviousness-type double patenting rejection in the Answer, we assume that the examiner has dropped the former rejection and substituted in its place the latter.

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We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellants and the examiner. As a consequence of our review, we will reverse the obviousness rejection of all claims over APA, Arai, and Suzuki, affirm the obviousness rejection of claims 18, 19, 23, 30, and 32 over Aoki, but reverse the obviousness rejection of claims 9, 10, 15, 20 through 22, 24 through 29, 31, and 33 through 44 over Aoki, and affirm the obviousness-type double patenting rejection of claims 18 through 27, but reverse the obviousness-type double patenting rejection of claims 9, 10, 15, and 28 through 44.

As a preliminary matter we note that the examiner has failed to differentiate the variations among the claims. The scope of the claims requires interpretation. "[T]he main purpose of the examination, to which every application is subjected, is to try to make sure that what each claim defines is patentable. [T]he name of the game is the claim." In re Hiniker Co., 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998) (quoting Giles S. Rich, The Extent of the Protection and Interpretation of Claims --American Perspectives, 21 Int'l Rev. Indus. Prop. & Copyright L. 497,

499, 501 (1990)). Without knowing what each claim defines, we cannot determine whether the claims distinguish over the prior art. Accordingly, before analyzing the rejections, we must determine the scope of the various claims.

Each of claims 9, 10, 15, 18 through 29, 31, and 33 through 44 specifies in pertinent part the generation of plural tone voltages. Specifically, claims 9, 10, 28, and 29 each recite (emphasis added) a device for "generating a plurality of tone voltages." Similarly, claims 18, 19, and 23 through 27 recite (emphasis added) "a voltage generator for ... generating a plurality of discrete output signals at respectively different voltage levels." Claims 20 through 22, 31, and 33 specify (emphasis added) that "2<sup>N</sup> different voltage levels" are generated." The method of claim 15 includes (emphasis added) "generating a plurality of multi-tone displaying voltages," and the methods of claims 36 and 41 recite (emphasis added) "producing a plurality of different multi-tone voltages." Methods of claims 38 and 43 specify that "2<sup>N</sup> kinds of voltage levels" are produced. Claims 34, 35, 37, 39, 40, and 42 each include a step of "producing multi-tone voltage selecting data." For voltages to be

selectable, there must be plural voltages. Therefore, we have interpreted "voltage selecting data" as plural voltages.

Similarly, claim 44 includes a circuit "for converting said ... multi-tone image data into voltage selecting data."

Accordingly, we have interpreted claim 44 as including the production of plural voltages.

In addition, claims 9, 10, 15, 28, 29, and 34 through 44 specify that the voltage output to the matrix display has a constant voltage level during a horizontal scanning period. In particular, claims 9, 10, 28, and 44 recite a voltage output having "a constant voltage level" for (claims 9 and 10) or during (claims 28 and 44) "one horizontal scanning period." Claim 15 recites supplying a voltage having "a constant voltage level ... in a period for latching data for one horizontal line." Claims 34 through 43 recite "outputting a multi-tone voltage having a constant voltage level during one horizontal scanning period." Claim 29 includes "voltage selecting means for selecting one of said tone voltages ... during one horizontal scanning period." Since only a single voltage is selected during the horizontal scanning period, we

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have interpreted claim 29 as including a constant voltage during that period.

We note that claims 18 through 27 and 30 through 33 include the phrase "a constant voltage level." However, no particular period is recited for the constant voltage level.

Turning to the obviousness rejections, for a rejection under 35 U.S.C. § 103, the examiner is required to provide a reason from some teaching, suggestion or implication in the prior art as a whole, or knowledge generally available to one of ordinary skill in the art, why one having ordinary skill in the pertinent art would have been led to modify the prior art to arrive at the claimed invention. Uniroyal, Inc. v. Rudkin-Wiley, 837 F.2d 1044, 1052, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988), cert. denied, 488 U.S. 825 (1988). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

The examiner first relies upon appellants' prior art Figures 1 and 2 (APA), and, recognizing (Answer, page 7) that APA does not have the function of tone display, applies



Suzuki. The examiner asserts, "Suzuki had shown plural voltages (i.e.  $V_1$ - $V_b$  with a selection means 8.[])] ... One of ordinary skill in the art would have been motivated by ... Suzuki to use plural tone voltages in Applicants [sic] prior art shown in Figures 1 and 2." Nowhere, however, does the examiner provide a teaching or suggestion from the prior art explaining why the skilled artisan would have been led to modify APA nor how to modify APA to arrive at the claimed invention. Since claims 9, 10, 15, 18 through 29, 31, and 33 through 44 each require the generation of plural tone voltages, as determined above, and claims 30 through 32 require outputting a multi-tone voltage, and since the examiner has not properly combined APA with a reference that teaches the missing limitations, the examiner has failed to establish a prima facie case of obviousness for claims 9, 10, 15, 18 through 44.

We should note that the examiner also includes Arai in the statement of the rejection (Answer, page 7). The examiner asserts that "Arai had shown the two claimed latch means and voltage selection means 400," even though he previously states that the only limitation lacking from APA is multiple tone

voltages. However, the examiner has provided no reason from the prior art as to why one of ordinary skill would have been motivated to modify APA to include the additional elements. Merely that the elements exist in the art and that the prior art can be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-4 (Fed. Cir. 1992). Therefore, the examiner has not properly combined APA, Suzuki, and Arai. Consequently, we must reverse the rejection of claims 9, 10, 15, and 18 through 44 over APA in view of Suzuki and Arai.

As to the obviousness rejection over Aoki, Figure 5 of Aoki shows that different gradations are produced by various combinations of voltages supplied to the liquid crystal. For each horizontal scan period, plural voltages output by the voltage generator may be selected, and each applied for a portion of the period. Thus, the selected output voltage is not constant over the entire horizontal scanning period. Accordingly, we must reverse the rejection of claims 9, 10, 15, 28, 29, and 34 through 44 which specify that the voltage

output to the matrix display has a constant voltage level during a horizontal scanning period, as determined above.

In addition, Aoki explains (column 3, lines 13-16) that the A/D converter converts the video signal into a 4-bit digital signal. The voltage generator outputs voltages  $V_0$ - $V_5$ , or 6 voltage levels (see column 3, lines 58-62), and 16 gradation levels (or  $2^4$  gradations) are formed by combinations of the 6 voltages (see figure 5). Claims 20 through 22, 31, 33, 38, and 43 recite that the number of voltage levels generated is  $2^N$ , where N equals the number of bits of information. Since the number of bits in Aoki is 4,  $2^4$  equals 16, the number of voltages is 6, and 6 is not 16, Aoki does not meet the claimed limitation. Accordingly, we must reverse the rejection of claims 20 through 22, 31, 33, 38, and 43 over Aoki.

Claims 24 through 27 include a timing correction circuit for correcting a phase deviation between the serial digital display data and the parallel digital display data. We find no such circuit in Aoki, and the examiner has failed to point to any specific structure to meet this limitation. Further, the examiner has failed to explain or provide any evidence

showing why such a timing correction circuit would have been obvious to the skilled artisan. Therefore, we cannot sustain the rejection of claims 24 through 27 over Aoki.

As to claims 18 and 19, appellants' sole argument (Brief, page 9) is that Aoki does not suggest an X-direction driving circuit which outputs a constant voltage level during a horizontal scanning period. However, as we determined above, claims 18 and 19 do not specify that the constant voltage must be for the entire scanning period. The claims merely state that the output signals from the generator are at different constant voltage levels. In Aoki, the voltages output from the generator 11 are constant for some period of time, though not necessarily for an entire horizontal scanning period. Therefore, we are not persuaded by appellants' argument, and we will affirm the rejection of claims 18 and 19 over Aoki.

For claim 23, appellants contend (Brief, page 10) that Aoki "fail[s] to teach or suggest a single tone voltage resulting from the selection of one of a plurality [sic] multi-tone image data which is held constant for one horizontal scanning period, and further fails to teach or suggest a tone voltage representing multi-tone image data."

As we have indicated above, claim 23 does not require that the voltage be held constant for a horizontal scanning period. Further, we find no reference to the image data's being "multi-tone" in claim 23. As to the selection of one of a plurality of image data, Aoki's multiplexer 8 selects a voltage level from  $V_0$ ,  $V_2$ ,  $V_3$ , and  $V_5$ , which have been output from generator 11, in accordance with the gradation signal generator 7. See, for example, Figure 1 and column 5, lines 11-14. Consequently, appellants' argument is not convincing, and we will sustain the rejection the claim 23 over Aoki.

Regarding the remaining claims, 30 and 32, appellants' only argument (Brief, page 11) is that Aoki fails to teach or suggest "a voltage output circuit which outputs a single multi-tone voltage having a constant voltage level as the display voltage according to a decoded result of a decode circuit of a display dot." However, Aoki's gradation signal generator 7 decodes the digital image data and forms a gradation signal as a result of decoding (column 3, lines 38-43). Aoki's multiplexer 8, or voltage output circuit, selects and outputs one of  $V_0$ ,  $V_2$ ,  $V_3$ , and  $V_5$ , or a single multi-tone voltage, in accordance with the gradation signal (column 5,

lines 11-14). Therefore, we again are not persuaded by appellants' argument, and we will affirm the rejection of claims 30 and 32 over Aoki.

Regarding the obviousness-type double patenting rejection, the examiner merely states (Answer, page 3) that the pending claims "are broader than claims 1-20 of U.S. Patent 5,298,912," without explaining how the claims correspond and particularly how they differ. Again we are left to do this analysis ourselves. We disagree with the examiner that the present claims are merely broader than the patent claims, as even a cursory analysis of the claims would reveal. After a careful review of both the patent claims and the claims on appeal, we find that only claims 18 through 27 would have been obvious over the patent claims, as will become clear from following discussion of the two sets of claims.

As noted above, appealed claims 9, 10, 15, 28, 29, and 34 through 44 specify that the voltage output to the matrix display has a constant voltage level during a horizontal scanning period. Although each of the patented claims recites that the output voltage must be a constant level, none of the claims specifies the period for the constant level. As we

find no evidence that maintaining the constant voltage level for the entire horizontal scanning period would have been obvious to the skilled artisan, we cannot sustain the obviousness-type double patenting rejection of claims 9, 10, 15, and 28, 29, and 34 through 44.

Further, as to claims 30 through 33, the only patent claims which recite a latch circuit and a decode circuit, which appear in each of claims 30 to 33, are claims 10 and 11. However, neither of claims 10 and 11 recites "a voltage output circuit for outputting a single multi-tone voltage having a constant voltage level ... during a period in which said Y direction driving circuit is determining said one of said plurality of continuous display dots supplied with the display voltage." Since the examiner has provided no evidence as to why the missing limitation would have been obvious to the skilled artisan in view of the patent claims, we cannot sustain the obviousness-type double patenting rejection of claims 30 through 33.

Claims 18 through 27 are very similar to patent claims 1, 2, 4, 5, 12, and 14 through 18, respectively, with three differences: 1) the present claims include an information

device for outputting analog image data, 2) the present claims recite a generator and driving, converter, and selector circuits whereas the patent claims recite generating means and driving, converter, and selector means, and 3) the present claims specify that the selector circuit is part of the X direction driving circuit. As to the addition of an information device, since the claimed analog/digital converter receives analog image data, it would have been obvious to the skilled artisan to include a device for providing such analog image data.

Regarding the remaining two differences, i.e. variations in scope between the various "means" in the patent claims and the presently claimed structures, 35 U.S.C. Section 112, paragraph 6 states that an element expressed only as a means-plus-function is to be construed to cover the corresponding structure described in the specification and equivalents thereof.

Thus, in construing means-plus-function language in a claim one must interpret that language in light of the corresponding structure described in the specification, and equivalents



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thereof. See In re Donaldson Co., 16 F.3d 1189, 1193, 29 USPQ2d 1845, 1849 (Fed. Cir. 1994).

In the present case, the only disclosed structure for each of the claimed means is that which is presently claimed. In particular, the disclosed Y direction driving means and A-D converter means are a Y direction driving circuit and an A-D converter circuit, the voltage generating means is a voltage generating circuit, upon which a generator reads, the selector means is a selector circuit, and the X direction driving means is an X direction driving circuit which includes the selector circuit. In re Lonardo, 119 F.3d 960, 967, 43 USPQ2d 1262, 1267 (Fed. Cir. 1997), cert. denied, 118 S. Ct. 1164 (1998) had a similar situation. The patent claim recited a means for securing, and the rejected claim recited a particular structure for securing. The only disclosed structure for implementing the securing function was the structure recited in the rejected claim. The court thus determined that the claimed means must be interpreted in the manner that is expressly recited in rejected claim, and that the rejected claim was therefore unpatentable over the patent claim on the ground of obviousness-type double patenting. Accordingly,

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present claims 18 through 27 are unpatentable over patent claims 1, 2, 4, 5, 12, and 14 through 18, respectively. Consequently, we will affirm the obviousness-type double patenting rejection of claims 18 through 27.

#### CONCLUSION

The decision of the examiner rejecting claims 9, 10, 15, and 18 through 44 under 35 U.S.C. § 103 over APA, Arai, and Suzuki is reversed. The decision of the examiner rejecting claims 9, 10, 15, and 18 through 44 under 35 U.S.C. § 103 over Aoki is affirmed as to claims 18, 19, 23, 30, and 32, and reversed as to claims 9, 10, 15, and 20 through 22, 24 through 29, 31, and 33 through 44. The decision of the examiner rejecting claims 9, 10, 15, and 18 through 44 under the doctrine of obviousness-type double patenting is affirmed as to claims 18 through 27 and reversed as to claims 9, 10, 15, and 28 through 44.

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No time period for taking any subsequent action in  
connection with this appeal may be extended under 37 CFR  
§ 1.136(a).

AFFIRMED-IN-PART

MICHAEL R. FLEMING	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
	)	BOARD OF PATENT
ANITA PELLMAN GROSS	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
	)	
	)	
	)	
STUART S. LEVY	)	
Administrative Patent Judge	)	

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